IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of Mark BEDNARSKI et al.

Serial No.:

06/26/2001

10/681,855

Examiner:

To be assigned.

Confirmation No.: 7135

Art Unit:

1614

Filed:

October 7, 2003

For:

X-Nitro Compounds, Pharmaceutical Compositions Thereof and Uses

Thereof

Mail Stop Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

POWER BY ASSIGNEE AND STATEMENT UNDER 37 C.F.R. §3.73(b)

The Assignee of the entire right, title, and interest in the above-identified application hereby grants the registered practitioners of Cooley Godward LLP included in the Customer Number provided below power to act, prosecute, and transact all business in the U.S. Patent and Trademark Office in connection with this application, any applications claiming priority to this application, and any patents issuing therefrom.

The Assignee certifies that to the best of its knowledge and belief it is the owner of the entire right, title, and interest in and to the above-identified application as evidenced by:

[X]	An assignment document, a copy of which is enclosed herewith;	
[]	An assignment previously recorded in the U.S. Patent and Tradem Office at Reel , Frame .	ıark

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Please direct all telephone calls and correspondence to:

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CUSTOMER NUMBER:

23419

The undersigned (whose title is supplied below) is empowered to sign this statement on behalf of the Assignee.

Date: 1/28/04

Signature:

Name: Title:

President

Company:

RadioRx, Inc.

Gordon M. Saul

Attorney Docket No: RADO-001/02US

PATENT

ASSIGNMENT (Joint)

Mark D. Bednarski, residing at 805 N. San Antonio Road, Los Altos, California 94022; Andrew C. Haaland, residing at 1665 Creekside Lane, Park City, Utah 84098 Susan J. Knox, residing at 18 Ryan Court, Stanford, California 94305

(each referred to as "Assignor") have made an invention(s) (the "Invention(s)") set forth in an application for patent of the United States, entitled X-Nitro Compounds, Pharmaceutical Compositions Thereof and Uses Thereof, and which is a:

(1)	[] provisional application			
	(a)	[] to be filed herewith; or		
	(b)	[] bearing Application No.	, and filed on	; or

(2) [X] non-provisional application

(a) [] to be filed herewith; or

(b) [X] bearing Application No. 10/681,855, and filed on October 7, 2003.

WHEREAS, RadioRx, Inc., a corporation duly organized under and pursuant to the laws of Delaware corporation, and having its principal place of business at 6511 Dumbarton Circle, Fremont, CA 94555 (the "Assignee"), is desirous of acquiring the entire right, title, and interest in: the Invention(s); the application for patent identified in paragraph (1) or (2); the right to file applications for patent of the United States or other countries on the Invention(s); any application(s) for patent of the United States or other countries claiming priority to these application(s); any provisional or other right to recover damages, including royalties, for prior infringements of these applications; and any patent(s) of the United States or other countries that may be granted therefor or thereon.

NOW, THEREFORE, for good and sufficient consideration, the receipt of which is hereby acknowledged, and to the extent that the Assignor has not done so already via a prior agreement with the Assignee, or if the Assignor has already done so via a prior agreement with the Assignee then in confirmation of any obligation to do so in said prior agreement, the Assignor has sold, assigned, transferred, and set over, and by these presents does sell, assign, transfer, and set over, unto the Assignee, its successors, legal representatives, and assigns, the Assignor's entire right, title, and interest in:

- (a) the Invention(s);
- (b) the application for patent identified in paragraph (1) or (2);
- (c) the right to file applications for patent of the United States or other countries on the Invention(s), including all rights under the Paris Convention for the Protection of Industrial Property and under the Patent Cooperation Treaty;
- (d) any application(s) for patent of the United States or other countries claiming the Invention(s);
- (e) any application(s) for patent of the United States or other countries claiming priority to the application for patent identified in paragraph (1) or (2) or any application(s) for patent claiming the Invention(s), including any division(s), continuation(s), and continuation(s)-in-part;

- (f) any provisional or other right to recover damages, including royalties, for prior infringements of any application for patent identified in the proceeding paragraphs (b)-(e); and
- (g) any patent(s) of the United States or other countries that may be granted for or on any application for patent identified in the preceding paragraphs (b) (e), including any reissue(s) and extension(s) of said patent(s).

The above-granted rights, titles, and interests are to be held and enjoyed by the Assignee, for its own use and behalf and the use and behalf of its successors, legal representatives, and assigns, as fully and entirely as the same would have been held and enjoyed by the Assignor had this sale and assignment not been made.

The Assignor hereby represents to the Assignee, its successors, legal representatives, and assigns, that, at the time of execution and delivery of these presents, or if applicable, at such time said prior agreement was executed, the Assignor is a lawful owner of an undivided interest in the entire right, title, and interest in and to the Invention(s), that the Invention(s) are unencumbered, except, if applicable, by obligation to assign in accordance with said prior agreement, and that the Assignor has good and full right and lawful authority to sell and convey the same in the manner set forth herein.

The Assignor hereby covenants and agrees to and with the Assignee, its successors, legal representatives, and assigns, that the Assignor will sign all papers and documents, take all lawful oaths, and do all acts necessary or required to be done in connection with any and all proceedings for the procurement, maintenance, enforcement and defense of the Invention(s), said applications, and said patents, including interference proceedings, without charge to the Assignee, its successors, legal representatives, and assigns, but at the cost and expense of the Assignee, its successors, legal representatives, and assigns.

The Assignor hereby authorizes and requests the attorneys of COOLEY GODWARD L.L.P. to insert in the spaces provided above the filing date, the application number, and the attorney docket number of the application identified in paragraph (1) or (2) when known.

The Assignor hereby requests the Commissioner of Patents to issue said patents of the United States to the Assignee for the sole use and behalf of the Assignee, its successors, legal representatives, and assigns.

Date: 4/23/04	By: Went Between)
1 1 '	Mark D. Bednarski	
Date:	By:	
	Andrew C. Haaland	
Date:	By:	
	Susan J. Knox	

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- (f) any provisional or other right to recover damages, including royalties, for prior infringements of any application for patent identified in the proceeding paragraphs (b)-(e); and
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The above-granted rights, titles, and interests are to be held and enjoyed by the Assignee, for its own use and behalf and the use and behalf of its successors, legal representatives, and assigns, as fully and entirely as the same would have been held and enjoyed by the Assignor had this sale and assignment not been made.

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Date:	By: Susan J. Knox

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incorporated a folded-path gas cell 10 embodying the present invention, the cell being comprised of a field reflector 12 and two objective reflectors 14. Input radiation R_I originates at the source 16 and is reflected by a parabolic mirror 18 into the interferometer 20, as represented by the beamsplitter 22 thereof. The modulated beam exiting the interferometer 20 impinges upon a parabolic mirror 24 and is projected upwardly thereby onto a flat mirror 26, by which it is projected into the gas cell 10.

In traversing the cell cavity, the principal input radiation ray $R_{\rm I}$ initially follows the path $R_{\rm I}$, $R_{\rm 2}$, $R_{\rm 3}$, and $R_{\rm 4}$, between object mirrors 14 and the field mirror 12. After making multiple passes, the radiation exits the cell as output beam $R_{\rm O}$, which is reflected by a hyperbolic mirror 28 and an elliptical mirror 30 onto a photoconductive detector 32. As is the nature of such folded-path gas cells, the input radiation $R_{\rm I}$ produces images at multiple points along the length of the field mirror 12, and at two or more levels to prevent their mutual interference, supplemental reflective elements (not shown) being provided within the cell as may be desired to multiply the number of image rows produced.

As depicted in Figure 2, the enclosure of the cell 10 is seen to include a body, generally designated by the numeral 34, and an end piece generally designated by the numeral 35 (the opposite end piece 38 not being visible in this Figure). Apertures 36, 36' are formed through the end piece 35 for the entry

and exit of input radiation $R_{\rm I}$ and output radiation $R_{\rm O}$, respectively.

Boxes I, I_{OI} and I_{OW} of Figure 2 indicate, respectively, an input image (comprised of rays from five points), the corresponding output image produced from a cell embodying the invention, and a comparable output image produced from a White cell (constructed as hereinabove described), as produced by radiation passing through the windows 36 and 36'. It is noted that the output image at box I_{OW} is far more scattered and indistinct than is that at box I_{OI} , which is only slightly blurred; moreover, the image at box I_{OW} is vignetted to a high degree by the outlet aperture 36'. The energy throughput characteristic of the instant gas cell is therefore seen to be much superior to that of prior art cells of similar construction.

Turning now to Figure 3, therein illustrated is the gas cell of the invention, in exploded form. All components are fabricated in relatively thick sections, and from the same grade of high thermal conductivity aluminum. This construction minimizes thermal distortion of the enclosure by causing dimensional changes to occur uniformly throughout, and thereby allows operation of the cell over wide temperature ranges without need for optical realignment.

The end piece 35 is formed with two laterally aligned compound sockets 37, 37', each of which opens at its inner end through an aperture 36, 36' (only aperture 36' being visible in this Figure), respectively. A window 46 of suitable material

(e.g., calcium fluoride, potassium bromide and zinc selenide, depending upon the anticipated conditions of operation, radiation wavelength, etc.) is seated in each socket 37, 37', sealed on its opposite faces by o-rings 44 and held in place by retaining rings 48, using screws 50.

The body 34 of the cell has a passageway 56 of rectangular cross section extending entirely through it and defining the cell chamber, into which block portions 58 and 66 of the opposite end pieces 38 and 35, respectively, are inserted. The end pieces are held in place by screws 40 passing through their respective flange portions 60 and 68, with mating surfaces being sealed by interposed o-rings 42. Openings 52 are formed through one wall of the body 34, and receive conduits 54 for the passage of gases to be analyzed into and from the chamber of the cell.

As is more fully described with reference to Figures 4 through 7, an elliptical reflective surface 70 is formed on the body portion 66 of end piece 35. The surface 70 may be regarded as generated about a machining spin axis "a", spaced a distance "x" from the outer surface of the piece, and is formed to have focii at points "f"; the distance "y" on the center-line indicates the closest approach of the reflective surface 70 to the opposite outer surface of the piece. By way of specific example, the distance "x" may have a value 11.6579 inches, "y" may be 10.9449 inches, each focus "f" may be 0.9843 inch from

the center-line, the thickness "t" of the piece 35 may be 0.981 inch, and the width "w" may be 4.410 inches.

Figures 8 through 10 more fully depict the end piece 38, the body portion 58 of which has produced thereon two side-byside, generally spherical reflective surfaces 62, 64, which meet at a line of discontinuity 63. Each of the surfaces 62, 64 has a cylindrical component superimposed thereupon, thus providing different radii of curvature in two orthogonal planes and therefore a contour that approaches toroidal. Line "b" in Figures 8 and 10 represents a spin axis spaced a distance "z" with reference to the outside surface of the end piece 38, about which the surfaces 62, 64 may be machined; the axes of revolution for the toroids of the surfaces 62, 64 are designated "c". In the exemplary cell, partially described above, the distance "z" may be 11.6406 inches, the axes "c" may be spaced 0.10766 inch behind axis "b" and separated from one another by 0.34670 inch, and surface radii in the plane depicted in Figure 8 may be 10.9276 inches in length. ness and width of end piece 38 may be the same as for piece 35, and in assembly the outer surfaces of the two pieces 35, 38 may be spaced 12.411 inches from one another.

Although the axis of cylinder extends parallel to the axis "b" in the illustrated embodiment, it will be appreciated that it could be perpendicular thereto (albeit with some sacrifice of design and manufacturing facility). Also, cylindrical curvature may be introduced into only one of the surfaces 62, 64

if so desired, and it is believed that negative as well as positive cylindrical curvature may be added. The focii of both objective reflector surfaces are tilted slightly (e.g., 0.09897 inch, in the exemplary cell described) below the centerline in the orientation depicted, to produce the desired rows of images across the field reflector without overlap, as mentioned hereinabove. Although an elliptical field reflector is preferred, other shapes (including spherical, toroidal, etc.) may be substituted if so desired, albeit with some expectation of loss of performance.

An additional feature of the cell, which is believed to be important to its optimal performance, resides in fixing the centers of curvature of the objective surfaces behind the elliptical surface 70. In an assembled unit having the specific construction described above, the centers of curvature of the objective mirrors would optimally lie 0.053 inch behind the elliptical surface; the focii of the elliptical reflector do however lie on the surfaces of the objective mirrors.

It is believed that the objects of the invention are achieved largely through improved coincidence of focus in two orthogonal planes (recognizing that, in even the best case, "focus" is itself essentially a rather amorphous collection of points), thereby controlling distortion, astigmatism, spherical aberration, and coma, and ultimately resulting in maximized energy throughput. Adding the cylindrical component serves of course to reduce the effective radius of curvature in one

plane, thus enabling light incident on the reflective surface to better approach the focus in the orthogonal plane.

Although a specific example of a cell embodying the invention has been provided, it will be appreciated that the dimensions and other parameters may vary greatly within the scope of the invention claimed. Particular radii values and other parameters can be determined empirically, by a computer-simulated ray-tracing program, manipulating parameters so as to achieve optimal fidelity between the output and input images.

As noted above, the optical surfaces are most desirably formed directly on the end pieces of which the enclosure is comprised. Although possible by conventional means, such direct formation may be done more economically and effectively by a diamond-machining technique; replication from a diamond-machined master (e.g., by transferring an epoxy-backed gold deposit from the master to the end piece) is also a highly desirable method for producing the reflective surfaces. Fabricated surfaces may of course be rendered fully specular by depositing thereupon a reflective material such as silver, and protective coatings may be applied thereto, as well.

Thus, it can be seen that the present invention provides a folded-path gas cell that is capable of higher radiation throughput and less image blur, as compared to prior art cells of equal or greater size, to thereby afford better operating parameters and to optimize the performance of associated optical instruments by preservation of resolution capability. As